

ALUMINUM

Success Story

INNOVATIVE SYSTEM BLOWS AWAY SORTING PROBLEMS FOR RECYCLERS



ELECTRONIC-PNEUMATIC SYSTEM SEPARATES ALUMINUM FROM MIXED RECYCLABLE STREAMS

Benefits

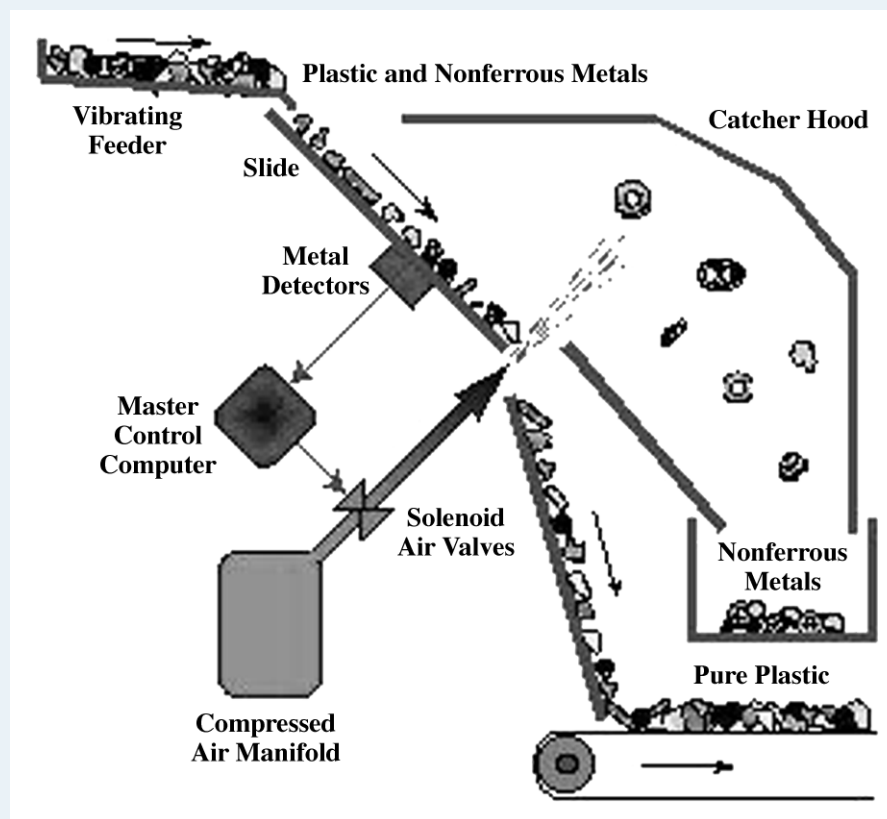
- Producing new aluminum products from recycled aluminum requires only about 10% as much energy as producing aluminum from ore
- Offers approximately 95% removal efficiency, making it more efficient and selective than other separating technologies
- Using recycled materials in production reduces energy consumption and furnace emissions compared with making plastic, glass, or aluminum from raw materials
- Efficient air jet separation mechanism requires very little energy

"We at MSS are gratified that the ELPAC™ technology enhances separation and decreases energy usage in industries as diverse as glass recycling, plastic recycling, aluminum recovery, and detection of metallic contaminants in auto tire manufacturing. Assistance from the Inventions and Innovation Program was a key component of commercializing this unique technology."

—Garry Kenny
ELPAC™ Inventor and
President of MSS

Recovering waste aluminum for recycling has a tremendous payoff in energy savings when it is used in the production of new aluminum products. As such, it is the most valuable component of municipal waste. On the other hand, the presence of metals in the recyclable stream is one of the biggest problems faced by plastic and glass recycling operations. Removal of iron and steel is relatively straightforward due to their magnetic qualities, but aluminum and other nonmagnetic metals pose a greater challenge for separation systems.

Recovering Aluminum from Municipal Waste



The ELPAC™ aluminum separator uses electronic eddy-current sensing and air jet pulses to separate aluminum from streams of mixed material, greatly improving the economics of plastic, glass, and aluminum recycling operations.



Solution

MSS, Inc., has developed a system that effectively and efficiently separates aluminum and other nonferrous metals from mixed waste streams. The Electronic-Pneumatic Aluminum Concentrator (ELPAC™) uses a series of electronic eddy-current detectors spaced across a falling waste stream to identify when a nonferrous metal – predominantly aluminum – object, such as a can or bottle cap, passes by. The detector triggers a precisely metered air jet pulse that blows the object – and a minimum amount of other material – into a separate stream for collection and secondary processing.

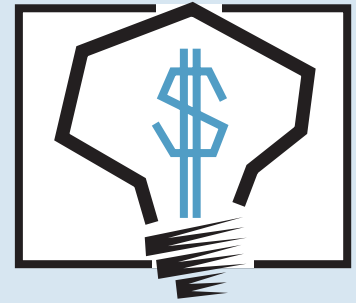
A \$49,000 grant from the Inventions and Innovation Program in 1984 allowed MSS to refine its electronic metal detectors so that they continually tune themselves for accurate detection of aluminum (or ferrous metals, if desired). The grant also helped MSS to operate prototype units for an extended period to demonstrate their reliability, as well as to collect economic data on operation to show the system's value.

ELPAC™ technology can be used to select and collect either ferrous or nonferrous metals or both. The system very effectively recovers aluminum and other nonferrous metals from mixed recyclable streams in materials recovery facilities. It is also ideal for extracting metallic contaminants from shredded plastic or cullet in plastic or glass recycling operations. The technology will also separate aluminum from unsorted waste streams.

Results

ELPAC™ separates aluminum from a mixed stream of other waste materials, outperforming all competing systems. With greater than 95% removal efficiency, it is much more productive and selective than conventional mechanical or single-detector technologies. It is also far less expensive to operate and uses much less energy than head-pulley, eddy-current aluminum separators used for final purification of aluminum for recycling. The system is available in modular units to handle feed system widths of 2 or 4 feet and feedrates of 2000 or 4000 pounds per hour of plastic or 10 or 20 tons per hour of cullet glass.

MSS, Inc., (formerly Magnetic Separations Systems, Inc.) – a 25 year-old company with 26 employees and a \$5,000,000 annual budget – manufactures, installs, and services systems for automated separation of plastics, wastepaper, and glass, in addition to ELPAC™ systems. MSS has already sold and installed more than 60 ELPAC™ systems – approximately 35 for use in plastic recycling operations, 20 for use in glass recycling operations, and 5 for aluminum recycling. There are approximately 500 large mixed recyclable facilities operating worldwide that could profitably install ELPAC™ systems.



The Inventions and Innovation Program works with inventors of energy-related technologies to establish technical performance and to conduct early development. Ideas that have significant energy-savings impact and market potential are chosen for financial assistance through a competitive solicitation process. Technical guidance and commercialization support are also extended to successful applicants.

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